IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appl. No. : 10/606,436 Confirmation No. 6928
Applicant : Steven M. Burns et al.
Filed : June 25, 2003
TC/A.U. : 1793
Examiner : Sikyin Ip

Docket No. : 085.10940-US(03-325)
Customer No. : 34704

APPEAL BRIEF

Sir:

This is an appeal to the Board of Patent Appeals and Interferences from the final rejection of claims 34 - 47, dated May 14, 2010, made by the Primary Examiner in Tech Center/Art Unit 1742.

REAL PARTY IN INTEREST

The real party in interest is United Technologies Corporation of Hartford, Connecticut.

RELATED APPEALS AND INTERFERENCES

The instant application was the subject of Appeal No. 2008-4945, decided on February 20, 2009. A copy of the decision rendered by the Board is attached hereto as part of Appendix C. The instant application was also the subject of a request for rehearing which was decided by the Board on June 11, 2009.

There are no other prior and pending appeals, interferences or judicial proceedings known to Appellants, Appellants' assignee, or Appellants' legal representative which may be related to, directly affect, or be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 34 - 37 are pending in the application. All claims stand rejected and are on appeal. Appendix A contains the claims on appeal.

Claims 1 - 33 and 48 - 52 have previously been cancelled.

STATUS OF AMENDMENTS

No amendment was filed after the final rejection.

SUMMARY OF CLAIMED SUBJECT MATTER

Claim 37 on appeal relates to a method for heat treating at least one workpiece. The method comprises the steps of: cleaning a furnace to be used during said heat treating method (see page 5, lines 30 - 32); said cleaning step being performed without said at least one workpiece being present in said furnace chamber (see page 7, lines 6 - 20); said cleaning step comprising introducing a cleaning gas into the furnace chamber only at a center of an area where the at least one workpiece is to be located (see page 7, lines 6 - 20); said introducing step comprising injecting said gas at a partial pressure and a flow rate sufficient to create a pressure differential within said furnace chamber which carries contaminants away from said center of an area where the at least one workpiece is to be located and toward an exit of said furnace chamber (see page 5, line 30 to page 6, line 4 of the specification); said cleaning step further comprising heating said furnace chamber at a temperature which is 200 to 300 degrees Fahrenheit above a temperature to be used in a subsequent diffusion heat treating step for at least 30 minutes (see page 5, lines 30 - 34 of the specification); and after said cleaning step has been completed, placing said at least one workpiece within said cleaned chamber and diffusion

heat treating said at least one workpiece in a gas atmosphere with said gas being introduced into the furnace chamber only at said center of an area in said furnace chamber where the at least one workpiece is to be located (see page 6, lines 13 - 16 of the specification).

As set forth in dependent claim 35, the gas injecting step comprises injecting said gas at a partial pressure of at least 0.8 Torr. (See page 4 of the specification, lines 17 - 24).

As set forth in dependent claim 36, the gas injecting step comprises injecting said gas into said furnace at a rate of 30 liters per minute to 70 liters per minute. (See page 6 of the specification, lines 7 - 9).

As set forth in dependent claim 37, the gas injecting step comprises injecting an inert gas. (See page 2 of the specification, lines 21 - 22).

As set forth in dependent claim 38, the gas injecting step comprises injecting argon. (See page 2 of the specification, line 22).

As set forth in dependent claim 39, the gas injecting step comprises injecting a reducing gas. (See page 2 of the specification, line 22).

As set forth in dependent claim 40, the diffusion heat treatment step is carried out at a temperature in the range of 1900 degrees Fahrenheit to 2500 degrees Fahrenheit for a time period in the range of 1 to 24 hours. (See page 6 of the specification, lines 27 - 30).

As set forth in dependent claim 41, the diffusion heat treatment step comprises introducing said gas at a rate sufficient to carry away contaminants in said at least one workpiece but less than a rate at which a door to said furnace

is caused to open. (See page 5, last line to page 6, line 7 of the specification).

As set forth in dependent claim 42, which depends from claim 41, the diffusion heat treatment step comprises introducing said gas into said workpiece center location at a partial pressure of at least 0.8 Torr. (See page 6 of the specification, lines 9 - 12).

As set forth in dependent claim 43, which depends from claim 42, the the method includes said gas being introduced into said furnace at a flow rate of 30 liters per minute to 70 liters per minute. (See page 6 of the specification, lines 7 - 9).

As set forth in dependent claim 44, which depends from claim 41, said diffusion heat treatment comprises introducing an inert gas. (See page 2 of the specification, line 25).

As set forth in dependent claim 45, which depends from claim 41, said diffusion treatment comprises injecting argon. (See page 6 of the specification, lines 16 - 20).

As set forth in dependent claim 46, which depends from claim 41, said diffusion heat treatment comprises injecting a reducing gas. (See page 2 of the specification, line 25).

As set forth in dependent claim 47, the injecting step further comprises providing a manifold (18) within said chamber (see Fig. 1; also see page 4, lines 32 - 33 of the specification), positioning said manifold at said center of an area where the at least one workpiece is to be located (see Fig. 1; also see page 4, lines 32 - 33 of the specification), and injecting said gas only at said center of an area where the at least one workpiece is to be located via said manifold (see page 4, lines 32 - 33 of the specification).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection to be reviewed on appeal are as follows:

(1) the rejection of claims 34 - 47 under 35 U.S.C. 112, second paragraph as being indefinite; and

(2) the rejection of claims 34 - 37 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,042,898 to Burns et al. in view of Japanese Patent Publication No. 6-213,981 or Japanese Patent Publication No. 2003027209.

ARGUMENT

(A) Claims 34 - 47 Comply With the Requirements of 35 U.S.C. 112, Second Paragraph

In the final rejection dated May 14, 2010, the Examiner contended that claim 34 is indefinite because of the presence of the phrase "center of an area". The Examiner avers this phrase is indefinite because the furnace chamber can be filled with workpieces and because the workpiece can be placed anywhere inside the furnace chamber. According to the Examiner, injecting gas where workpieces are in the furnace chamber reads on treating the entire or any portion of the furnace chamber. Appellants submit that there is nothing indefinite about the subject matter being claimed.

The second paragraph of 35 U.S.C. 112 requires that (a) the claims must set forth the subject matter which Applicants regard as their invention; and (b) the claims must particularly point out and distinctly define the metes and bounds of the subject matter that would be protected by the patent grant. See MPEP 2171. Since the Examiner has not stated that Appellants have not set forth the subject matter which they regard as their invention, part (a) of the test has been satisfied.

With regard to part (b) of the test, if the language of the claim is such that a person could interpret the metes and bounds of the claim so as to understand how to avoid infringement, then the second paragraph of 35 U.S.C. 112 has been satisfied. *See Morton Int'l Inc. v. Cardinal Chem Co.*, 5 F.3d 1464, 1470 (Fed. Cir. 1993). The test for indefiniteness is whether those skilled in the art would understand what is claimed when the claim is read in light of the specification. *See Orthokinetics Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576 (Fed. Cir. 1986).

Fig. 1 in the instant application illustrates the center 20 of the workpiece location where the gas is to be injected into the chamber 14. In fact, Fig. 1 also shows a representation of the area where the workpieces are to be placed. The specification, on page 7, lines 14 - 17, clearly says that the workpiece center location is typically the furnace center. Appellants submit that in light of this disclosure, there is nothing indefinite about the phrase "said cleaning step comprising introducing a cleaning gas into the furnace chamber only at a center of an area where the at least one workpiece is to be located". One of ordinary skill in the art would know that the at least one workpiece is to be located in a certain area of their chamber and would also know whether the cleaning gas is being introduced only at a center of that area. One of ordinary skill in the art could easily determine how to avoid infringement of that limitation, i.e introduce a gas at a location other than the center of the area where the at least one workpiece is located, such as along a wall edge of the furnace chamber. Appellants submit that since one of ordinary skill in the art could determine the metes and bounds of this limitation and would understand how to avoid the claim, claim 34

fully complies with the requirements of the second paragraph of 35 U.S.C. 112.

On this point, Appellants note that the Examiner has not pointed out why, when the claim is read in light of the specification, one of ordinary skill in the art would not understand its meaning. The Examiner's comments about injecting gas where the workpieces are in the furnace chamber reading on treating the entire or any portion of the furnace chamber are irrelevant to the issue at hand. Claim 34 says that the cleaning gas is to be injected only at a center of an area where the at least one workpiece is to be located. As discussed above, one of ordinary skill in the art would know the area where the workpiece or workpieces is/are to be located and would know where the center of the area is.

For these reasons, the rejection of claims 34 - 47 on indefiniteness grounds should be withdrawn.

(B) Patentability of Claims 34 - 47

(1) Independent Claim 34

Independent claim 34 is directed to a method for heat treating at least one workpiece comprising the steps of: cleaning a furnace chamber to be used during said heat treating method; said cleaning step being performed without said at least one workpiece being present in said furnace chamber; said cleaning step comprising introducing a cleaning gas into the furnace chamber only at a center of an area where the at least one workpiece is to be located; said injecting step comprising injecting said gas at a partial pressure and a flow rate sufficient to create a pressure differential within said furnace chamber which carries contaminants away from said center of an area where the at least one workpiece is to be located and

toward an exit of said furnace chamber; said cleaning step further comprising heating said furnace chamber at a temperature which is 200 to 300 degrees Fahrenheit above a temperature to be used in a subsequent diffusion heat treating step for at least 30 minutes; and after said cleaning step has been completed, placing said at least one workpiece within said cleaned chamber and diffusion heat treating said at least one workpiece in a gas atmosphere with said gas being introduced into the furnace chamber only at said center of an area in said furnace chamber where the at least one workpiece is to be located.

Appellants have found that significant improvements can be made in heat treating coated workpieces by first cleaning the chamber in which the workpieces are to be placed in a way which moves contaminants away from the area in which the workpieces are to be located. To this end, Appellants perform the cleaning process by injecting a gas into the furnace chamber *only* at a center of the area where the at least one workpiece is to be located. This is illustrated in Figure 1 of the instant application. The gas, which is introduced solely at this location, is introduced at a partial pressure and a flow rate sufficient to create a pressure differential which carries contaminants away from said center and toward an exit of said furnace chamber. After cleaning has been completed, the at least one workpiece is placed in the cleaned chamber and subjected to a diffusion heat treatment where again the gas which is injected into the chamber is injected only at said center.

The improvements in the treated workpieces can be seen from Figures 2 to 4 in the application, which are appended hereto as Exhibit B. Figure 2 illustrates a workpiece with an as deposited and diffused coating. Figure 3 illustrates a coating

which has been formed using the method described herein and which coating was surface finished by shot peening. As can be seen from Figure 3, the coating is free of pores, voids, and other bad features. In fact, the coating is homogeneous and has very good ductility. Figure 4 illustrates a coating which was not formed using the clean furnace and heat diffusion treatment of the present invention. As can be seen from Figure 4, the coating has voids and fissures which makes it quite brittle. See page 8, lines 4 - 14 of the specification. On this point, it should be noted that the Examiner does not argue that this portion of the description is inaccurate as to what is shown in the Figures.

In the final rejection of May 14, 2010, claims 34 - 47 were rejected as being unpatentable over U.S. Patent No. 6,042,898 to Burns et al. in view of JP 6219810 or JP 2003027209. It is believed that these references do not render the subject matter of claim 34 obvious. Burns et al. is directed to a method for applying improved durabile thermal barrier coatings. During the processing of the coated article in Burns et al., undesired oxides and contaminants are removed from a bond coat with an ionized gas stream cleaning process, such as a reverse transfer arc process. See column 3, line 33 to column 4, line 23 of Burns et al. Clearly, Burns et al. requires that the blade (2) to be cleaned be present in the vacuum chamber. This portion of Burns et al. is not describing the claimed technique for cleaning a furnace chamber prior to performing a diffusion heat treating step. Burns et al. is directed to cleaning a particular coating applied to an article. In other words, the article is already in the chamber during the cleaning operation. In contrast, Appellants are cleaning the chamber without any article or workpiece being present. This is now clearly spelled

out in amended claim 34. Further, there is no disclosure in Burns et al. of injecting the gas used to remove the contaminants *only* at the center of the location where the workpieces are to be placed. Still further, there is no disclosure in Burns et al. of placing said at least one workpiece within said chamber after said cleaning step has been performed and diffusion heat treating said at least one workpiece in a gas atmosphere with said gas being injected only at said center of the area where the at least one workpiece is located.

When combined with Burns, the two Japanese patent documents do not cure these deficiencies in Burns et al. JP 62139810 relates to a method and apparatus for cleaning the interior of a tempering furnace. There is no disclosure in this reference of injecting a gas into the furnace *only* at the center of the location where workpieces are to be placed and there is no disclosure of injecting the gas at a partial pressure and a flow rate sufficient to create a pressure differential which carries contaminants away from said center and toward an exit of said furnace chamber. JP 2003027209 relates to a surface hardening treatment method for deep hole of parts in vacuum furnace. Here again, there is no disclosure of injecting a gas *only* at the center of the location where workpieces are to be placed and there is no disclosure of injecting the gas at a partial pressure and a flow rate sufficient to create a pressure differential which carries contaminants away from said center and toward an exit of said furnace chamber.

Still further, neither Japanese reference discloses the step of, after said cleaning step has been completed, placing said at least one workpiece within said cleaned chamber and diffusion heat treating said at least one workpiece in a gas

atmosphere with said gas being injected only at said center.

The Examiner in making the rejection makes the statement that cleaning workpiece at any step is contemplated within ambit of ordinary skill artisan when the workpiece is contaminated. While this statement may be true (and on this point it should be noted that the Examiner has provided no evidence of the ordinary level of skill in the art); however, claim 34 does not call for cleaning the workpiece. The claim calls for cleaning the furnace chamber prior to placing the workpiece to be heat treated into the cleaned furnace chamber.

The Examiner also says cleaning the contaminated furnace chamber without workpiece in contaminated furnace chamber is contemplated within ambit of ordinary skill artisan in order to avoid contaminating the workpiece. First, the Examiner makes an assumption as to what is known in the art. There is no evidence of record which supports this statement. It is well settled law that obviousness must be based on facts, not on the Examiner's assumption as to what is known in the art. See *In re Zurko*, 258 F.3d 1379, 1383, 1385 (Fed. Cir. 2001)(reversing as unsupported by substantial evidence a finding of motivation to combine cited references, where the Board adopted Examiner's unsupported assertion that claim limitation missing from cited references was "basic knowledge" and it "would have been nothing more than good common sense" to combine the references, and explaining that "[t]his assessment of basic knowledge and common sense was not based on any evidence in the record"). The Examiner does have the burden of establishing that the common sense knowledge was in the art. See *In re Bozek*, 416 F.2d 1385, 1390 (CCPA 1969). Second, even if cleaning the contaminated furnace chamber without workpiece is known, there is no evidence of record that shows such cleaning would take place in the manner

called for by claim 34 - namely "said cleaning step comprising introducing a cleaning gas into the furnace chamber only at a center of an area where the at least one workpiece is to be located" and "said injecting step comprising injecting said gas at a partial pressure and a flow rate sufficient to create a pressure differential within said furnace chamber which carries contaminants away from said center of an area where the at least one workpiece is to be located and toward an exit of said furnace chamber."

The Examiner goes on to say that with respect to the gas flow rate that it would have been obvious to one having ordinary skill in the art to adjust the gas flow rate in order to balance cost of gas and cleanness of the gas, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. Once again, the Examiner makes an assumption as to the knowledge in the art. There is no evidence of record which would establishes this as a matter of fact. Furthermore, the injecting step which is claimed requires both a partial pressure and a flow rate which is sufficient to create a pressure differential within said furnace chamber which carries contaminants away from the center of the area where the at least one workpiece is to be located and toward an exit of said furnace chamber. The Examiner does not explain how one of ordinary skill in the art looking to balance the cost of gas and cleanness of gas would arrive at the aforesaid method step. Conclusory statements such as that provided by the Examiner do not fulfill the agency's obligation to explain all material facts relating to the obviousness rejection. *See In re Lee*, 277 F.3d 1338, 1344 (Fed. Cir. 2002) The Examiner has not connected to the dots and provided an explanation how one having this purported common sense knowledge

would arrive at adjusting both partial pressure and flow rate so as to create a pressure differential which carries contaminants away from the center of the area where the at least one workpiece is located and toward an exit of the furnace.

The Examiner goes on to say that cleaning a furnace includes cleaning the center of the furnace. Missing from this statement is recognition that Appellants are not claiming cleaning the center of the furnace but rather cleaning the area where the workpieces are to be located, which may be the center of the furnace or not. Further, this statement does not address the manner in which the cleaning step is performed, i.e., the gas is introduced only at the center of the workpiece location area and the aforesaid partial pressure and flow rate.

With regard to the Examiner's comments about JP 2003027209, such comments are misleading. JP2003027209 clearly says that the parts 90, a gas transport pipe 40 and a fixing appliance 30 are cleaned and dried, and installed in the prescribed positions in the heating space within a vacuum surface. See the Abstract. It should be noted that this disclosure is a teaching away from doing what Appellants are doing. Instead of cleaning the furnace, JP 2003027209 cleans the parts, the gas transport pipe, and the fixing appliance first. Further, there is no statement which says that the product (90), and hence the transportation pipe (40), are located in the center of the furnace. All that is said is that they are established near in a heating space, (see paragraph 0004). As can be seen from Fig. 3 of the '209 patent document, such positions include non-central positions assuming that the drawings are drawn to scale and the size of the workpiece was accurately drawn with respect to the size of the furnace (which in all likelihood it is not).

With regard to JP 62-139810, there is no disclosure of the inert gas used during the cleaning process being introduced into the chamber only at the center of the area where the workpiece(s) are to be located. At the top of page 8 of the translation, it is said that an inert gas is sealed into the furnace from a gas supply pipe not shown in the figure. Thus, one having this patent document before him/her has no knowledge from this disclosure precisely where the gas supply pipe is located. The Examiner points out that the abstract in this reference teaches to heat inside of the treatment furnace at a temperature higher than heat treatment temperature. The specification clarifies this statement by pointing out that the higher temperature is slightly higher than the heat treatment temperature. See paragraph (2) on page 8 of the translation. What this means in terms of specific temperatures is unknown because the reference never quantifies the term "slightly higher" nor does the reference provide any examples of what temperatures are being used.

The Examiner concludes the obviousness rejection by saying that it would have been obvious to one having ordinary skill in the art of the cited references to clean a heat treatment furnace as taught by JP 62139810 or JP 2003027209 in order to improve/provide a clean furnace for heat treatment. As pointed out above, the '209 Japanese reference does not disclose cleaning a furnace prior to a heat treatment. Further, while the '810 Japanese reference may disclose cleaning a furnace, there is no disclosure of cleaning the furnace in the manner set forth in the claim 34. As noted above, this reference is vague as to the location of the gas inlet pipe. Further, it does not disclose using the partial pressure and flow rate set forth in the claim.

With regard to the Examiner's comment on page 5, lines 3 - 5 as to it being unclear what made the improvement if the improvement exists and that there is no measurable data comparison to show the difference. On this point, the specification, on page 8, lines 5 - 7, clearly says that the coating shown in Fig. 3 was formed using the method described herein and was surface finished by shot peening. The absence of voids, pores and other bad features shown in Fig. 3 are not created by the shot peening because they are internal to the coating and are not affected or created by the shot peeing. As for measurable data comparison, one can take the coatings shown in Figures 2 - 4 and measure the presence of pores, voids, and other bad features in Figure 4 for example and note the absence of such pores, voids, and other bad features in Fig. 3. Thus, measurable data comparison is present which shows the difference. Figure 4, clearly shows a coating having voids and fissures in a quantity which makes it quite brittle. Such voids and fissures are not present in the coating of Fig. 3. Thus, the improvement created by the method of the present invention is clearly visible by comparing the two Figures.

With regard to the Examiner's comments on page 5 of the action that since the location of the workpiece can be anywhere in the furnace chamber, the cleaning gas can be introduced anywhere in the furnace chamber, such comments are wrong. The claim calls for the gas to be introduced only at the center of the location of the workpiece(s). Thus, even though the location of the workpiece can be anywhere in the furnace chamber, an area where the workpieces are placed is still created and the gas still has to be introduced *only* at the center of the workpiece location.

With regard to the Examiner's comments on page 6 of the action that it is unclear how the claimed step cleans pockets, voids, and etc., such comments show that the Examiner has misapprehended what the specification and the claims. There is nothing in either that says that Appellants are cleaning voids, pockets, etc. Appellants, using the method set forth in claim 34, produce a coating which is free of voids, pockets, and etc. What is cleaned is the furnace chamber prior to the performance of a diffusion heat treatment.

With regard to the Examiner's comments about the flow rate on page 6 of the office action, as set forth in the claim, the flow rate has to be less than that which would cause the furnace door to open and great enough to carry the contaminants from the center 20 of the workpiece location towards low pressure area 26 about the furnace chamber. As for the unexpected result of using such a flow rate, Appellants again point to the coating of Fig. 3. There is nothing in the prior art which would indicate that such a coating could be formed using the flow rate set forth in the claim.

In conclusion, it is submitted that the Examiner has failed to make a *prima facie* case of obviousness. The references fail to teach or suggest all the method steps set forth in claim 34 and the Examiner attempts to fill the gaps in the references by relying on purported "common sense" for which no evidence has been presented. It seems to Appellants that the Examiner has failed to establish the "level of skill in the art" by any competent evidence.

For these reasons, the rejection of claim 34 on obviousness grounds should be reversed.

(2) Patentability of claims 35 - 47

Claims 37 - 39 and claims 44 - 46 stand or fall with their parent claim(s).

Claims 35 and 42 are allowable because none of the cited and applied prior art discloses introducing the gas at a partial pressure of at least 0.8 Torr. The references provide no guidance as to what would be a suitable partial pressure - in particular, a partial pressure which carries contaminants away but which does not cause the door to open. Nothing in the prior art indicates that the partial pressure which is to be used should accomplish this result. Hence, the prior art references provide no guidance as to what one of ordinary skill in the art should do. Thus, even though one of ordinary skill in the art would understand that the gas will be introduced at a pressure, there is nothing which would lead him to arrive at the claimed pressure because nothing in the prior art explains that the partial pressure must be such as to lead contaminants away from the center of the area where the workpieces are to be located and which does not cause the furnace chamber door to open.

Claims 36 and 43 are allowable because none of the cited and applied prior art references disclose introducing the gas at a flow rate of 30 liters per minute to 70 liters per minute. The references provide no guidance as to what would be a suitable flow rate - in particular a flow rate which carries contaminants away but which does not cause the furnace chamber door to open. Nothing in the prior art indicates that the flow rate which is to be used should accomplish this result. Hence, the prior art references provide no guidance as to what one of ordinary skill in the art should do. Thus, even though one of ordinary skill in the art may understand that the gas will be introduced at a flow rate, there is nothing in the prior art

references which would lead him to arrive at the claimed flow rate which as discussed above is result oriented.

With regard to claim 40, there is nothing in the cited and applied references which teaches or suggests that the diffusion treatment is to be carried out at a temperature in the range of from 1900 degrees Fahrenheit to 2500 degrees Fahrenheit for a time period in the range of 1 to 24 hours. While the '810 reference may disclose using a slightly higher temperature than the tempering treatment, there is nothing in the reference which says what "slightly higher" means and which would lead one to use a diffusion treatment at the claimed temperature. On this point, it should be noted that the treatment being performed in the '810 reference is a tempering treatment, not a diffusion treatment.

Claim 41 is allowable for the same reason as claims 36 and 43. The references provide no guidance as to what would be a suitable flow rate - in particular, a flow rate which carries contaminants away but which does not cause the door to open. Nothing in the prior art indicates that the flow rate which is to be used should accomplish this result. Hence, the prior art references provide no guidance as to what one of ordinary skill in the art should do. Thus, even though one of ordinary skill in the art would understand that the gas will be introduced at a flow rate, there is nothing which would lead him to arrive at the claimed flow rate which is result oriented.

Claim 47 is allowable because none of the cited and applied references teach or suggest positioning a manifold at the center of an area where the at least one workpiece is to be located and injecting the gas only at the center of an area where the at least one workpiece is located via the manifold. The above discussion about the lack of any disclosure of injecting gas

only at the center of an area where the at least one workpiece is located are equally applicable here.

CONCLUSION

For the foregoing reasons, the Board is hereby requested to reverse the rejection of claims 34 - 47 and remand the application to the Primary Examiner for allowance and issuance.

FEES

The Director is hereby authorized to charge the Appeal Brief Fee of $540.00 to Deposit Account No. 21 - 0279. Should the Director determine that an additional fee is due, he is hereby authorized to charge said fee to said Deposit Account.

Respectfully submitted,

Steven M. Burns et al.

By/Barry L. Kelmachter #29999/
Barry L. Kelmachter
BACHMAN & LaPOINTE, P.C.
Reg. No. 29,999
Attorney for Appellants

Telephone: (203)777-6628 ext. 112
Telefax: (203)865-0297
Email: docket@bachlap.com

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CLAIMS ON APPEAL - APPENDIX A

34. A method for heat treating at least one workpiece comprising the steps of:

cleaning a furnace chamber to be used during said heat treating method;

said cleaning step being performed without said at least one workpiece being present in said furnace chamber;

said cleaning step comprising introducing a cleaning gas into the furnace chamber only at a center of an area where the at least one workpiece is to be located;

said introducing step comprising injecting said gas at a partial pressure and a flow rate sufficient to create a pressure differential within said furnace chamber which carries contaminants away from said center of an area where the at least one workpiece is to be located and toward an exit of said furnace chamber;

said cleaning step further comprising heating said furnace chamber at a temperature which is 200 to 300 degrees Fahrenheit above a temperature to be used in a subsequent diffusion heat treating step for at least 30 minutes; and

after said cleaning step has been completed, placing said at least one workpiece within said cleaned chamber and diffusion heat treating said at least one workpiece in a gas atmosphere with said gas being introduced into the furnace chamber only at

said center of an area in said furnace chamber where the at least one workpiece is to be located.

35. A method according to claim 34, wherein said gas injecting step comprises injecting said gas at a partial pressure of at least 0.8 Torr.

36. A method according to claim 35, wherein said gas injecting step comprises injecting said gas into said furnace at a rate of 30 liters per minute to 70 liters per minute.

37. A method according to claim 34, wherein said gas injecting step comprises injecting an inert gas.

38. A method according to claim 34, wherein said gas injecting step comprises injecting argon.

39. A method according to claim 34, wherein said gas injecting step comprises injecting a reducing gas.

40. A method according to claim 34, wherein said diffusion heat treatment step is carried out at a temperature in the range of 1900 degrees Fahrenheit to 2500 degrees Fahrenheit for a time period in the range of 1 to 24 hours.

41. A method according to claim 40, wherein said diffusion heat treatment step comprises introducing said gas at a rate sufficient to carry away contaminants in said at least one workpiece but less than a rate at which a door to said furnace chamber is caused to open.

42. A method according to claim 41, wherein said diffusion heat treatment step comprises introducing said gas at a partial pressure of at least 0.8 Torr.

43. A method according to claim 42, wherein said gas is introduced into said furnace at a flow rate of 30 liters per minute to 70 liters per minute.

44. A method according to claim 41, wherein said diffusion heat treatment comprises introducing an inert gas.

45. A method according to claim 41, wherein said diffusion treatment comprises introducing argon.

46. A method according to claim 41, wherein said diffusion heat treatment comprises introducing a reducing gas.

47. A method according to claim 34, wherein said injecting step further comprises providing a manifold within said chamber, positioning said manifold at said center of an area where the at least one workpiece is to be located, and injecting said gas only at said center of an area where the at least one workpiece is to be located via said manifold.

EVIDENCE - APPENDIX B

FIGS. 2 - 4 FROM PAT. APPLICATION SN 10/606,436 ON APPEAL

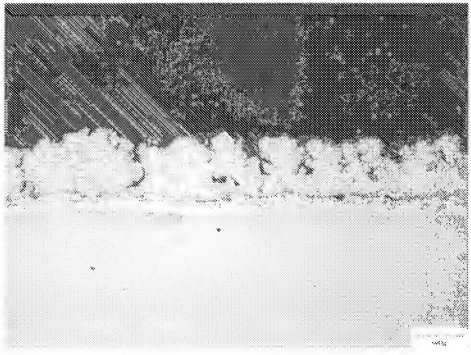

FIG. 2

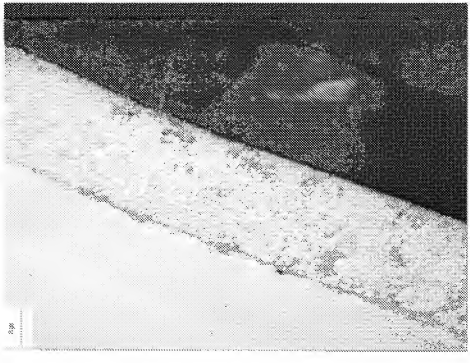

FIG. 3

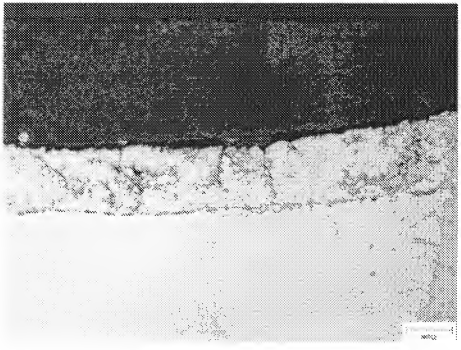

FIG. 4

RELATED PROCEEDINGS – APPENDIX C

DECISION ON APPEAL NO. 2008-4945

DECISION ON REHEARING OF APPEAL NO. 2008-4945

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10/606,476	06/25/2003	Steven M. Bowie	085.10940-US (03-325)	6928

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BACHMAN & LAPOINTE, P.C.
900 CHAPEL STREET
SUITE 1201
NEW HAVEN, CT 06510

EXAMINER	
ip, vikvin	
ART UNIT	PAPER NUMBER
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The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEVEN M. BURNS and STEVEN P. HAHN

Appeal 2008-004945
Application 10/606,436
Technology Center 1700

Decided:[1] June 11, 2009

Before EDWARD C. KIMLIN, LINDA M. GAUDETTE, and MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

KIMLIN, *Administrative Patent Judge*.

Response due - 8-11-09

DECISION ON REQUEST FOR REHEARING

Appellants request rehearing of our Decision of February 20, 2009 ("Decision"), wherein we sustained the Examiner's rejection of the

[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

appealed claims under 35 U.S.C. § 103(a).

We have carefully considered the arguments set forth in Appellants' Request, but we remain of the opinion that the Examiner drew the proper legal conclusion that the claimed subject matter would have been obvious to one of ordinary skill in the art within the meaning of § 103.

Appellants submit that we misapprehended their argument with respect to Burns not teaching a diffusion heat treating step. However, Appellants expressly state in their Reply Brief that "there is nothing here [in Burns] which teaches a diffusion heat treating step" (Reply Br. 3, first para.). As set forth in our Decision, Burns provides a specific teaching of such and Appellants' Request does not dispute this.

As for the claim recitation "gas being injected at a workpiece center location", Appellants submit that "there is one, and only one, interpretation of the phrase" (Request 4, second para.). However, while there is only one center of the workpiece, the claimed step of injecting the gas can be performed in a variety of ways such that the gas impinges other areas of the workpiece and at the center location from a variety of angles. We note that Appellants do not dispute our finding that the appealed claims are sufficiently broad to encompass injecting gas at the entirety of the workpiece, including its center location. Appellants have not refuted our rationale that it would have been obvious for one of ordinary skill in the art to inject gas at the entirety of Burns's workpiece during the diffusion heat treating step and, thereby, perform the claimed step of injecting gas at a workpiece center location. Nor have Appellants submitted any reason why the diffusion heat treating step of Burns would not result in gas being injected at the center of the workpiece.

Appellants also contend that we have erroneously ignored the factual and objective evidence of unexpected results represented by Figures 3 and 4 of the present Specification. In response to our statement in the Decision that Appellants have not presented the requisite analysis of the Specification Figures, and "[i]t is not for this Board to ferret out factual data in the record and interpret it in a light most favorable to the applicant" (Decision 5, third para.), Appellants maintain that "the differences in coatings are clear from a mere viewing of Figures 3 and 4 – **no explanation is required**" (Request 6, emphasis added). However, it is fundamental that the burden of demonstrating unexpected results rests on the party asserting them,[2] and that Appellants must demonstrate that the evidence is reasonably commensurate in scope with the degree of protection sought by the appealed claims,[3] that the evidence presents a comparison with the closest prior art,[4] and that the evidence would have been considered truly unexpected by one of ordinary skill in the art.[5] Manifestly, Appellants have not carried their burden on this record.

In conclusion, based on the foregoing, Appellants' Request to reconsider our Decision has been granted, but is denied with respect to making any change therein.

DENIED

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a) (2008).

[2] *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972).
[3] *In re Grasselli*, 713 F.2d 731, 743 (Fed. Cir. 1983).
[4] *In re Johnson*, 747 F.2d 1456, 1461 (Fed. Cir. 1984).
[5] *In re Merck & Co.*, 800 F.2d 1091, 1098-99 (Fed. Cir. 1986).

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO.
10/060,436	08/25/2003	Steven M. Burns	085.10040/US (03-325)	6928

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EXAMINER	
IP, SIEVIN	

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEVEN M. BURNS
and STEVEN P. HAHN

Appeal 2008-4945
Application 10/606,436
Technology Center 1700

Decided:[1] February 20, 2009

Before EDWARD C. KIMLIN, LINDA M. GAUDETTE, and MICHAEL P. COLAIANNI, *Administrative Patent Judges.*

KIMLIN, *Administrative Patent Judge.*

DECISION ON APPEAL

Resp. Due 4-20-09

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This is an appeal from the final rejection of claims 1-23, 28, and 29. Claims 24-27 and 30-33 have been withdrawn from consideration as being directed to a non-elected invention. Claims 1 and 15 are illustrative:

1. A method for heat treating at least one workpiece comprising the steps of:

cleaning a furnace to be used during said heat treating method;

said cleaning step comprising injecting a gas at a workpiece center location and applying heat; and

diffusion heat treating said at least one workpiece in a gas atmosphere with said gas being injected at said workpiece center location.

15. A method for providing at least one workpiece having a coating comprising the steps of:

diffusion heat treating said at least one workpiece in gas atmosphere within a furnace with said gas being injected at a workpiece center location;

removing said workpiece from said furnace; and

subjecting said coated workpiece to a surface finishing operation.

The Examiner relies upon the following references as evidence of obviousness:

Burns	US 6,042,898	Mar. 28, 2000
Naoyuki (as translated)	JP 62139810	Jun. 23, 1987
Ritaku (as translated)	JP 2003027209	Jan. 29, 2003

Appellants' claimed invention is directed to a method for heat treating a workpiece comprising cleaning a furnace by injecting a gas at a workpiece center location and applying heat, and diffusion heat treating the workpiece

by injecting gas at the workpiece center location. Independent claim 15 on appeal recites a method for diffusion heat treating a workpiece but does not recite the step of cleaning the furnace.

Appealed claims 1-14, 28, and 29 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Burns in view of JP '810 and JP '209. Claims 15-23 stand rejected under 35 U.S.C.§103(a) as being unpatentable over Burns.

We have thoroughly reviewed each of Appellants' arguments for patentability. However, we are in complete agreement with the Examiner that the claimed subject matter would have been obvious to one of ordinary skill in the art within the meaning of§103 in view of the applied prior art. Accordingly, we will sustain the Examiner's rejections for essentially those reasons expressed in the Answer.

We consider first the§103 rejection of claims 15-23. Appellants submit the "there is nothing here [in Burns] which teaches a diffusion heat treating step" (Reply Br. 3, first para.). However, Burns expressly discloses the following:

> The thermal barrier coating of the present invention may be deposited directly onto the blade **2** as shown or may be deposited over an undercoating on or diffused into the surface of the blade **2**. For example, the thermal barrier coating of the present invention may be deposited over a diffusion aluminide coating diffused into the surface of the blade **2**. (col. 2, ll. 44-50).

Burns further discloses that "the metallic bond coat **6** may comprise a diffusion aluminide" (col. 2, ll. 66-67). Hence, contrary to Appellants' argument, Burns provides a clear teaching of a diffusion heat treating step.

Also, while Burns does not specify which area or location of the workpiece the gas is injected at during the diffusion heat treating, we are persuaded that it would have been obvious for one of ordinary skill in the art to inject the gas at the entirety of the workpiece, including its center location. Significantly, claim 15 does not recite that the gas is injected only at a workpiece center location and, indeed, Appellants have not specifically defined the meaning of the language "gas being injected at a workpiece center location." The breadth of the claim recitation is open to a myriad of interpretations.

We now turn to the§ 103 rejection of claims 1-14, 28, and 29 over Burns in view of JP '810 or JP '209. Claim 1 recites a cleaning step in addition to a diffusion heating step. The cleaning step comprises injecting a gas at a workpiece center location and applying heat. Burns discloses cleaning the workpiece to remove oil, other organic or carbon-forming contaminants, surface oxides, etc. at elevated temperatures in an oxidizing atmosphere (*see* col. 3, ll. 33 *et seq.*). Burns also teaches ionized gas stream cleaning of the workpiece (col. 3, l. 49). As with Burns' diffusion heat treating step, Burns does not specify the particular area or location of the workpiece at which the cleaning gas is injected. However, we are satisfied that it would have been obvious for one of ordinary skill in the art to inject the cleaning gas of Burns at all areas or locations of the workpiece, including the center location. Claim 1 does not recite that the cleaning gas is injected only at the workpiece center location, nor does claim 1 require any particular order in which the cleaning and diffusion heat treating steps are performed. Appellants have provided no specific definition for the center location of the workpiece. Also, JP '810 and JP '209 provide further

evidence of the obviousness of cleaning a furnace and its components with an inert gas at elevated temperatures.

Appellants' additional arguments with respect to dependent claims have been adequately addressed by the Examiner.

As a final point, we note that Appellants base no argument upon objective evidence of nonobviousness, such as unexpected results. While Appellants state that they "have already provided evidence of an unexpected result obtained in an unexpected way" (Principle Br. 13, first para.), Appellants have not shouldered their burden of demonstrating unexpected results by providing the requisite factual evidence and analysis thereof. Appellants' reference to Figures 3 and 4 of the present Specification as demonstrating unexpected results will not be considered as untimely. Arguments not raised in the Principal Brief are considered waived. In any event, Appellants have not set forth the required analysis of the Specification figures. It is not for this Board to ferret out factual data in the record and interpret it in a light most favorable to the applicant.

In conclusion, based on the foregoing, the Examiner's decision rejecting the appealed claims is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R.§1.136(a)(1)(iv)(effective Sept. 13, 2004).

AFFIRMED

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900 CHAPEL STREET
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NEW HAVEN, CT 06510